AXOPODIAL SURFACE MOTILITY IN THE HELIOZOON *ACTINOPHRYS SOL*

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Axopodial surface motility was found to be present in *Actinophrys sol*. Extracellular marker particles, such as polystyrene microspheres attached to the axopodial surface, exhibited bidirectional movement along the axopodial surface. The beads were translocated at various velocities, and finally they were always accumulated at the axopodial tip and finally discarded. However, when polystyrene beads were bound to the secretory glycoprotein (gp40) of *Actinophrys*, they were carried to the cell body surface and ingested into food vacuoles. These results suggest that gp40 has a function to alter the net direction of the axopodial surface motility for efficient taking-up of prey organisms.

STRUCTURE OF *Paramecium caudatum* MITOCHONDRIAL TYPE I PLASMID DNA.

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Many stocks of Paramecium caudatum and other related species were found to contain linear double-stranded DNA plasmid in their mitochondria, which were the first discoveries in eukaryote other than fungi and higher plants (Tsukii. *et al*, 1994). The plasmids were structurally classified into three types.

We determined the complete sequence of Type I plasmid DNA isolated from P. caudatum Nn4a mitochondria. The plasmid consists of 6,680 nucleotides, and shows high AT rich (78.8%) characteristics. It has inverted repeat sequences consist of 6 bps at both end. Two ORFs showing homologies to DNA polymerase and RNA polymerase respectively were identified.

(Tsikii,Y., Endoh,H. and Yazaki,K. (1994) *Jpn. J. Genet.*, **69**, 685-696.)

Relationship between cell body movement and vitamin B_{12} deficiency in *Euglena gracilis*

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In vitamin B_{12}-deficient cells of *Euglena gracilis*, suppression of the degree cell body movement (euglenoid movement) and concomitant cell volume increase are known to occur. Moreover, in vitamin B_{12}-deficient cells, a characteristic regular array of intramembrane protein (IP39) particles is reported to be disintegrated. Degree of cell movement was assessed by the sensitivity of *Euglena* cells to a membrane-intercalating drug, chlorpromazine. In control cell on 9 days of cell culture, euglenoid cell shape change was induced by <0.3 mM chlorpromazine, while more than 4 mM was needed for vitamin B_{12}-deficient cells. To examine if such a difference is due to differences in motile machinery for euglenoid movement, detergent-extracted cell models were prepared from both control and vitamin B_{12}-deficient cells, and their reactivation in cell motility was examined. Vitamin B_{12}-deficient cells showed active reactivation of euglenoid movement like control cells, which indicates that 1) molecular mechanism of euglenoid movement is not deteriorated by vitamin B_{12}-deficiency, and 2) regular arrangement of IP39 proteins in the plasma membrane is not required for euglenoid cell movement.

COMPARISON OF NUMBERS AND SIZES IN TWO TYPES OF DICYEMID MESOZOAN EMBRYOS

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Dicyemid mesozoans are species-specific parasites of cephalopod mollusks. Characters relating to numbers and sizes of vermiform and infusoriform stages, and gametes were examined in a diversity of dicyemid species. (1) The size of adult vermiform stages and the number of both gametes and infusoriform embryos present within the axial cell of the parent were positively correlated. (2) The size of infusoriform embryos and the size of parents were not correlated, however, embryo size was related to maximum mantle length of cephalopod host species. (3) The number of vermiform embryos present within the axial cell and the size of parent were not correlated, however, embryo size was positively correlated with maximum size of adult vermiform stage. (4) The size of adult vermiform stages and the maximum mantle length of cephalopod host species were not correlated. (5) In dicyemids the size of adult vermiform stages appears to be adapted to constraints of the renal habitat within each cephalopod host species and thus may be influenced by a) the volume of the renal sac, b) the diameter of the renal tubules, or c) the surface relief (=depth of folding) of the renal appendages.

THE STUDY OF EARLY STAGE OF CONJUGATION IN BLEPHARISMA JAPONICUM

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In conjugation of *Blepharisma japonicum*, two mating types I and II are participated. The cells of each mating type excrete gamones, which cause the cells to start conjugation. We studied the function of gamones and morphological differences between homotypic and heterotypic pairs. (1) The complementary gamones (c-gamones) induced morphological change in cells before pair formation. The MCI (morphological change index, the ratio of cell length to width) decreased when cells were treated with c-gamones, and it retained after the pair formation.The MCI in homotypic pairs recovered when isolated in the fresh buffer, while it did not change in the heterotypic pairs.The c-gamones were required to maintain the MCI in homotypic pairs. (2) When pairs were transferred to gamone-free solution, only heterotypic pairs persisted. The homotypic pairs separated when they were isolated to gamone-free solution, but they persisted when the c-gamones were added.The c-gamones were required to maintain the homotypic pairs. (3) The heterotypic pairs gradually lost their capacity to form food vacuoles. When they lost the capacity, the degeneration of the cytostomal structures was observed.

Inhibitory Effect of Cysteine on Homocysteine-induced Cell Death of Cultured Bovine Vascular Endothelial Cells

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Homocysteine has been recognized recently prevalent risk factor for vascular disease, such as myocardial infarction and arteriosclerosis. Previous studies have demonstrated that low concentrations of homocysteine inhibit vascular endothelial cell proliferation and high concentrations of homocysteine induced vascular endothelial cell death. In the present study, we demonstrated that an equivalent concentration of cysteine inhibited vascular endothelial cell death by a high concentration (3mM) of homocysteine. Whereas, a high concentration (3mM) of cysteine as well as homocysteine induced cell death in other cell strains such as fibroblast cells (TIG-1), cervical cancer cells (HeLa). Here an equivalent concentration of cysteine together with homocysteine inhibited these cells death. Taken together, these results suggest that mercaptide conjugation of cysteine to homocysteine suppressed the cell death induced by high concentrations of homocysteine.